09/825,800   MS150903.1

REMARKS

It is noted that the Office Action Summary sheet states that the current status of the Office Action is set as being *non-final*, but yet the Examiner's boilerplate conclusion paragraph indicates final. Applicants' representative has proceeded with addressing this Reply as non-final in view of these inconsistencies in the Office Action.

Claims 1-66 are currently pending in the subject application and are presently under consideration. A version of all pending claims is found at pages 2-14. Claim 4 has been amended to further emphasize novel features of the claimed invention. Favorable reconsideration of the subject patent application is respectfully requested in view of the amendments and comments herein.

I.   **Rejection of Claims 1-9, 14-16, 19, 22-28 and 32-35 Under 35 U.S.C. §103(a)**

Claims 1-9, 14-16, 19, 22-28 and 32-35 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Barrett *et al.* (US 6,005,597) in view of Payton (US 5,790,935). It is submitted that this rejection should be withdrawn for at least the following reasons. Neither Barrett *et al.* nor Payton, alone or in combination, teach or suggest all limitations set forth in the claimed invention.

> To reject claims in an application under §103, an examiner must establish a *prima facie* case of obviousness. A *prima facie* case of obviousness is established by a showing of three basic criteria. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, *the prior art reference (or references when combined) must teach or suggest all the claim limitations.* See MPEP §706.02(j). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. See *In re Vaeck,* 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (emphasis added).

15

Applicants' claimed invention relates to a system and method of caching data guided by a probabilistic predictive model, *e.g.*, collaborative filtering models and other statistical and/or probabilistic models that can be used to infer likelihood of a user's preferences for content. The subject invention as claimed has particular application to multimedia systems for providing storage of a subset of available view selections by assigning a value or utility to a selection and retaining selections in the cache depending on the value and size of a selection.

i.   *Independent Claim 1*

Independent claim 1 recites a system for storing information locally that is received from an information delivery system for viewing at a local system comprising three components, *e.g.*, a database system, an inference system and a local storage system. In particular independent claim 1 recites: *a database system that logs selections of previously viewed information at a local system received from an information delivery system*. It is apparent that applicants' claimed invention logs selections of previously viewed information, which is viewed locally, into a database system. The database system itself resides and comprises local, and/or remote, and/or distributed databases spread across a plurality of servers into which user preferences are automatically and continuously stored. Barrett *et al.* and Payton, neither alone nor in combination, teach or suggest such an exemplary database system.

Barrett *et al.* simply teaches a method and apparatus for television program selection. As the Examiner concedes in the Office Action dated December 3, 2003, page 6, paragraph 4, Barrett *et al.* fails to teach or suggest a database system that logs selections of previously viewed information at a local system that is received from an information delivery system.

The Examiner contends that Payton makes up for the shortcomings presented by Barrett *et al.* Payton teaches a virtual on-demand delivery of digital information over existing digital transport systems by offloading a portion of the systems' peak bandwidth requirements to local subscribers; in essence, time shifting the partial caching of digital information to off peak hours to provide virtual on-demand delivery of digital content. In

16

particular, the Examiner asserts that Payton suggests a database system comparable to that claimed by applicants. Applicants' representative disagrees. Rather, Payton recites a database that resides on a central server that stores a subscriber profile. The subscriber profile consists of a rating vector wherein the subscriber rates items that he or she has previously requested; updates to the subscriber profile however, are performed during off-peak hours. In contrast, the claimed invention *automatically and continuously* updates the database system with the latest viewing information based upon probabilistic predictive models utilizing the time interval or time segment of previously viewed selections. It is apparent therefore that Payton does not teach of suggest a database system that *automatically and continuously* logs information in a database that resides and comprises local, and/or remote, and/or distributed databases spread across a plurality of servers. Payton simply teaches a single database that is stored on a central server and which is updated during off-peak hours.

Moreover, independent claim 1 recites *an inference system trained by the log selections of previously viewed information and that assigns values to selections in a recommendation list based on the previously viewed information*, wherein the log information relating to previously accessed media is utilized to enable the inference system, through the use of a probabilistic predictive model, to assign values to selections in a recommendation list pertaining to previously viewed information. Neither Barrett nor Payton teach this novel aspect.

In view of at least the foregoing, it is requested that the rejection of independent claim 1, together with claims that depend there from, should be withdrawn since neither Barrett *et al.* nor Payton, alone or in combination, teach or suggest each and every limitation set forth in applicants' claimed invention.

ii.   *Independent Claim 14*

The claimed invention recites a multimedia system that stores information received from a delivery system locally comprising two components, *e.g.* a cache loading system and a utility system. The information received from the delivery system and that is stored locally, is subsequently viewed locally either in real time, or at a more

convenient time. Independent claim 14 recites *a cache loading system that receives a list of selections from a program delivery system and stores program selection information corresponding to the list of selections in a local memory system; and a utility system that monitors program selection information in the local memory system and communicates value information to the cache loading system for removing information residing in the local memory system in exchange for information having a higher value received by the program delivery system*. The cache loading system receives inferences ranked by preference value from an inference system, and/or direct instructions to record specific titles from a filtering system *via* a user interface. Once the cache loading system receives these inferences and/or instructions, the cache loading system requests the appropriate program information from a remote program source and stores this information in a memory system based upon the dictates set forth by the utility system. The utility system utilizes a cache retention policy to monitor program selection information in the local memory system and communicates value information to the cache loading system for removing information residing in the local memory system in exchange for information having a higher relative value received from the program delivery system. Thus, the claimed invention is capable, through the utilization of the cache loading system and the utility system, of storing the entire program content that is requested. Neither Barrett *et al.* nor Payton, alone or in combination, recite such a novel system.

As discussed above, Barrett *et al.* simply teaches a method and apparatus for television program selection, and further, as Examiner concedes, Barrett *et al.* does not teach or suggest the multimedia system that is taught in the claimed invention.

The Examiner asserts that Payton makes up for the deficiencies presented by Barrett *et al.* Applicants' representative respectfully disagrees. Payton as stated *supra*, simply recites time shifting the partial caching of digital information to off peak hours to provide virtual on-demand delivery of digital content. Payton does not teach either the cache loading system or the utility system as recited by applicants' claimed invention.

Payton does not teach a cache loading system that is capable of storing the entire program selection into local memory. Payton rather teaches a delivery system that only

09/825,800   MS150903.1

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loads a *substantial portion* of the system's bandwidth requirement by intelligently caching data. The cache loading system as recited by the claimed invention on the other hand, is capable of caching, in concert with the claimed utility system, the *entire program selection* into local memory. Thus, Payton does not teach the claimed cache loading system as recited in the claimed invention.

Moreover, Payton fails to teach or suggest the utility system as disclosed in applicants' claimed invention. Payton in particular does not teach *removing information residing in the local memory in exchange for information having a higher value received from the program delivery system*. Payton simply teaches a scheduling processor that retrieves prioritized items from a central repository in order to obviate transmission of data during peak periods. Nowhere in Payton is it taught or suggested that information is removed from local memory in exchange for information having a higher value than that which is received from the program delivery system. It is apparent therefore, that Payton does not teach or suggest this exemplary feature.

In view of at least the foregoing it is respectfully submitted that neither Barrett *et al.* nor Payton, alone or in combination, teach or suggest each and every limitation set forth in the claimed invention. Accordingly, this rejection should be withdrawn with respect to independent claim 14 and its associated dependent claims.

iii.   *Independent Claim 32*

Applicants' claimed invention relates to multimedia system adapted to store information locally that is received from a program delivery system; the information that is stored locally can then be viewed locally. The multimedia system as recited in independent claim 32 comprises three components, a memory loading system, a storage system adapted to store a multimedia program for uninterrupted viewing, and a viewing system to retrieve the multimedia program for local viewing. Moreover, independent claim 32 specifically recites: *a local system having a memory loading system operable to determine a portion of a multimedia program, downloadable from a remote source to the local system, to store locally based on a local viewing rate and a remote transmission rate of the multimedia program*. Clearly, the multimedia system as recited

19

is contemporaneously capable of downloading multimedia programs from a remote source to the storage system while at the same time allowing multimedia programs to be viewed locally based upon the local viewing rate and the remote transmission rate of the multimedia program. The system therefore is capable, not only of allowing completely downloaded multimedia programs of being viewed, but is also capable of allowing multimedia programs that are in the process of being downloaded to be viewed while they are being downloaded and stored in the storage system. Neither Barrett *et al.* nor Payton, alone or in combination, teach or suggest this novel aspect of the applicants claimed invention.

As the Examiner acknowledges, Barrett *et al.* fails to teach a local system having a memory loading system operable to determine a portion of a multimedia program, downloadable from a remote source to the local system, to store locally based on a local viewing rate and a remote transmission rate of the multimedia program. Therefore Examiner seeks to utilize Payton to rectify those aspects of the subject invention that Barrett *et al.* fails to teach.

As discussed *supra*, Payton simply teaches time shifting the partial caching of digital information to off peak hours to provide virtual on-demand delivery of digital content. Payton fails to teach or suggest a local system with a memory loading system capable of determining a portion of a multimedia program downloadable from a remote source to a storage system based upon the viewing rate and the remote transmission rate of the multimedia program. To the contrary, Payton teaches a scheduler that simply schedules the download of multimedia programs to off-peak hours, and when on-demand requests are made by subscribers, the viewing rate and the remote transmission rate of the multimedia program are not taken into consideration; the transmission of the multimedia program is not based either on the rate at which the multimedia program is being viewed by the subscriber, nor the remote transmission rate of the multimedia program. It is apparent therefore, that Payton does not teach or suggest this novel aspect the subject claimed invention.

In view of at least the foregoing it is submitted that neither Barrett *et al.* nor Payton, alone or in combination, teach or suggest all the limitations set forth in

20

independent claim 32. Accordingly, it is requested that the rejection with respect to independent claim 32, and associated dependent claims, should be withdrawn.

II.   Rejection of Claims 37-56 Under 35 U.S.C. §103(a)

Claims 37-56 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Barrett *et al.* in view of Macrae *et al.* (US 6,233,734). It is submitted that this rejection should be withdrawn for at least the following reasons. Neither Barrett *et al.* nor Macrae *et al.*, alone or in combination, teach or suggest all the limitations set forth in the subject claimed invention.

i.   Independent claims 37 and 47

Independent claims 37 and 47 teach a similar claim limitation, namely: *removing information from the storage medium as its value causes it to fall outside the limits of the storage medium*. The claimed invention therefore removes information from a storage medium based upon a dynamically changing value calculated and associated with each item stored on the storage medium. The value that the claimed invention dynamically calculates is based upon numerous factors, for example, the age of a particular item, changes in the user's viewing habits, changes in time segments, modification by the user of predefined rules and storage policies, and the context/content of the particular item. A value density based upon a ratio of the value assigned to particular media content and the memory cost associated with storing the content based upon the size of the content is subsequently computed. Based upon this continuously calculated value density and the values associated with each item stored on the local storage medium, a decision is made as to whether or not to remove a particular item from the storage medium. As conceded by the Examiner, Barrett *et al.* does not teach or suggest this exemplary aspect, and further it is submitted, neither does Macrae *et al.* teach or suggest this aspect of the claimed invention.

Macrae *et al.* relates to a system and method for controlling the broadcast and recording of television programs and for distributing information to be displayed on a television set. Macrae *et al.* does not download multimedia information content, but

rather is confined to the distribution of television schedules and/or television guides to subscribers' set-top boxes. More specifically, Macrae *et al.* does not download multimedia program information content based upon a system calculated value, let alone removing content from the storage medium based upon the relative difference between a system calculated value associated with the new downloaded multimedia program information content and the system calculated value associated with existing downloaded multimedia program information. It is apparent therefore that Macrae *et al.* fails to teach or suggest removing information from a storage medium *as its value causes* it to fall outside the limits of the storage medium. Accordingly, it is submitted that the rejection with respect to independent claims 37 and 47, and claims that depend there from, should be withdrawn

ii. Independent claim 53

Independent claim 53 recites *a utility system operable to monitor program selection information in the local memory system and communicate value information to the cache loading system wherein high values are assigned to live show selections currently in progress, which are quickly decayed after the show is no longer live wherein live shows residing in the local memory having lower values are aged out in exchange for live shows having a higher value received by the program delivery system.* Neither Barrett *et al.* nor Macrae *et al.* teach or suggest a exemplary utility system wherein high values are assigned to live show selections that are currently in progress, and then for the rapid decay or diminishment of these values shortly after the selection is no longer live, such that previously live shows are ultimately aged out in exchange for subsequent live shows that have a higher value when received by the program delivery system. In fact, the Examiner acknowledges that Barrett *et al.* does not teach or suggest this aspect of the claimed invention, and it is submitted that nowhere in Macrae *et al.* is such a facility taught or suggested.

The Examiner asserts that Macrae *et al.* teaches a decaying facility comparable to that taught by the claimed invention. Applicants' representative disagrees. Macrae *et al.* simply teaches an alphanumeric ordering facility that ranks broadcast program schedule

information based upon channel number, or name, or upon a user's viewing habits. Macrae et al.'s ranking system does not rely upon whether or not a show is live, but rather is based primarily upon the length of time that a user dwells on a particular channel and to a diminishing extent the length of time that the user has previously dwelt on a particular channel; no account is taken of whether or not a show is live in assessing the ordering and decay of the broadcast program schedule information. It is manifest therefore that Macrae et al. does not teach or suggest applicants' claimed decaying facility. Accordingly, the combination of Barrett et al. and Macrae et al. does not teach or suggest the aspect of the claimed invention recited in independent claim 53, and its associated dependent claims. Accordingly, this rejection should be withdrawn.

III.   Rejection of Claims 10-13, 17-18, 20-21, 29-31 and 36 Under 35 U.S.C. §103(a)

Claims 10-13, 17-18, 20-21, 29-31 and 36 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Barrett et al. in view of Payton and further in view Macrae et al. It is submitted that this rejection should be withdrawn for at least the following reasons. Claims 10-13, 1-18, 20-21, 29-31 and 36 depend from independent claims 1, 14 and 32, and Payton and Macrae et al. do not make up for the deficiencies presented by Barrett et al. with respect to independent claims 1, 14 and 32 as discussed above. Withdrawal of this rejection is respectfully requested.

IV.   Rejection of Claims 57-58 and 61 Under 35 U.S.C. §103(a)

Claims 57-58 and 61 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Macrae et al. in view of Barrett et al, in view of Payton and further in view of Macrae et al. It is submitted that this rejection should be withdrawn for at least the following reasons. Macrae et al., Barrett et al. and Payton, either alone or in combination, fail to teach or suggest each and every claim limitation as recited in the claimed invention.

Independent claim 57 recites in part, *an inference component that employs the log information in application of a utility-based analysis in connection with selectively*

storing to and/or deleting items from a local storage space. Applicants' claimed invention clearly utilizes a utility-based knapsack analysis to provide inferences to selectively store and/or delete items from local storage. The utility-based knapsack analysis is based on an expected value density of content, which is defined as the ratio of the value assigned to a particular item of media content and the memory cost of storing that content based on the size of the content. The utility-based knapsack analysis is continuously and automatically performed upon the log information relating to the historical access of items of media content. Alone or in combination, Macrae *et al.*, Barrett *et al.* and Payton, do not teach or suggest this aspect of the claimed invention.

The Examiner clearly concedes that Macrae *et al.* does not teach or suggest the inference component employing log information relating to historical access to items to provide inferences as to whether items should be stored and/or deleted from local storage based upon a utility-base knapsack analysis. Thus, the Examiner attempts to utilize Barrett *et al.* to rectify the inherent deficiencies posed by Macrae *et al.* alone. However, it is submitted that Barrett *et al.* does not teach or suggest utilizing a utility-based knapsack analysis to predict/infer and selectively store and/or delete items from local storage based upon historical access to items of media content. Rather, Barrett *et al.* bases its decisions to store and/or delete items upon similarities with other users, not historical access to items that currently exist is the local storage space. Thus, neither Macrae *et al.* nor Barrett *et al.* teach of suggest this exemplary aspect of the claimed invention. Accordingly, in view of at least the foregoing, it is respectfully submitted that this rejection should be withdrawn with respect to independent claim 57 (and claims that depend there from).

V.   **Rejection of Claims 59-60 and 62-65 Under 35 U.S.C. §103(a)**

Claims 59-60 and 62-65 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Macrae *et al.* in view of Barrett *et al.* and further in view of Payton. It is submitted that this rejection should be withdrawn for at least the following reasons. Claims 59-60 and 62-65 depend from independent claim 57, and Barrett *et al.* and Payton do not make up for the deficiencies inherent in Macrae *et al.* with respect to independent

24

09/825,800   MS150903.1

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claim 57, and therefore do not make obvious applicants' claimed invention. Accordingly, this rejection should be withdrawn.

VI.   Rejection of Claim 66 Under 35 U.S.C. §103(a)

Claim 66 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Macrae *et al.* in view of Barrett *et al.* in view of Payton and further in view of Macrae *et al.* It is submitted that this rejection should be withdrawn for at least the following reasons. Macrae *et al.*, Barrett *et al.* and Payton do not make obvious applicants' claimed invention.

Independent claim 66 recites *a means for applying the values in a value density-based utility analysis in connection with at least one of: replacement, retention, and compression of the subset of items to a memory.* The claimed invention thus relates to a means of utilizing calculated value densities within a utility-based knapsack analysis in order to replace, retain or compress a subset of items to facilitate optimal memory utilization. Neither Macrae *et al.*, Barrett *et al.* nor Payton teach or suggest this unique aspect of the claimed invention.

As Examiner concedes, Payton does not teach or suggest a means for applying the values in a value density-based utility analysis in connection with at least one of: replacement, retention, and compression of the subset of items to a memory. Examiner therefore attempts to utilize Macrae *et al.* to make up for the deficiencies presented by Payton. As has been set forth previously, applicants' representative submits that Macrae *et al.* fails to teach or suggest utilizing an automatically and continuously calculated value density-based knapsack analysis in order to replace, retain or compress a subset of items to memory, in order to optimize memory utilization. Nowhere in Macrae *et al.* is such a exemplary feature taught or suggested. Accordingly, since this novel aspect is not obvious in view of Payton, Macrae *et al.* and Barrett *et al.*, this rejection should be withdrawn.

25

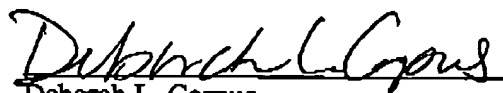09/825,800   MS150903.1

CONCLUSION

The present application is believed to be in condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063.

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,

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26